REMARKS

In accordance with the foregoing, claims 5 and 9 have been amended and new claim 12 has been added. No claims have been added, cancelled, or withdrawn. Therefore, claims 1-12 are pending and under consideration, which is respectfully requested.

Claim 5 has been amended to clarify the claim language and to delete the phrase "a step of" as unnecessary verbiage. Claim 9 has been amended to clarify the claim language. New claim 12 corresponds to claim 5, but recites "an aqueous liquid medium." Antecedent basis for this language can be found in paragraph [0113] of the specification, which describes that "as a medium using in the above production process where the medium is used to disperse solid contents in suitable liquid medium afterwards, water is preferable."

No new features and/or new matter have been added. Accordingly, entry and approval of claims 5, 9 and 12 are respectfully requested.

I. Rejection Under 35 U.S.C. § 112, second paragraph

The Office Action rejects claim 9 under 35 U.S.C. § 112, second paragraph as being indefinite. The Office Action asserts that claim 9 is unclear as to what temperature is considered normal where claim 9 recites "liquid or semisolid at normal temperature."

Claim 9 has been amended to replace the phrase "normal temperature" with "room temperature." Antecedent basis may be found in paragraph [0028] of US 2007/0190017 A1 (hereinafter "the Specification"). Paragraph [0028] uses the term "normal temperature" with reference to Patent Documents 20 and 24. However, the Abstracts of Patent Documents 20 and 24 recite "room temperature" in place of "normal temperature." Therefore, the two terms are interchangeable in the Specification.

Accordingly, the rejection of claim 9 has been resolved and should be withdrawn, which is respectfully requested.

II. Rejection Under 35 U.S.C. § 103

The Office Action rejects claims 1-11 under 35 U.S.C. § 103 as being obvious over Obae et al. (WO 02/02643; English-language equivalent US 2004/0053887 relied upon as translation) (hereinafter "Obae") in view of Yaginuma (JP 01-272643) ("Yaginuma-1"), Yaginuma (JP 02-084401) ("Yaginuma-2"), Yaginuma et al. (JP 03-264537) ("Yaginuma-3"), Kennedy et al. (Journal of the European Ceramic Society, 1997) ("Kennedy"), and Ek et al. (US 5,607,695) ("Ek").

Paragraph [0012] of the Specification describes that the cellulose powders of Obae (i.e. Patent Document 8) have poor flowability and an angle of repose that is too high because the particles of the Obae cellulose powders lack the intentionally-formed pores formed therein which are described in the present application.

In Yaginuma-1, porous cellulose particles are obtained by mixing cellulose particles with a third ingredient such as crystalline material insoluble or poorly soluble in water and soluble in an organic solvent; mixing the mixture with a granulator while adding an aqueous solution of water-soluble organic solvent to form granules; and then extracting the third ingredient with an organic solvent from the granules.

The porous cellulose particles resulting from the Yaginuma-1 process described above do not have the claimed secondary aggregate structure formed by the aggregation of primary cellulose particles. Instead, the porous cellulose particles of Yaginuma-1 form a strong dense film-like cellulose wall structure comprising primary cellulose particles compacted so uniformly and continuously that the borders of the particles are indistinct. Therefore, the Yaginuma-1 particles have a particle structure completely different from the claimed porous cellulose aggregate.

The porous fine cellulose particles of Yaginuma-2 are obtained by granulating particulate natural cellulose dispersed in an organic solvent and then drying the granulated particulate natural cellulose according to a spray-drying method. As a result, the Yaginuma-2 fine cellulose particles also do not have a secondary aggregate structure formed by the aggregation of primary cellulose particles. Like Yaginuma-1, the fine cellulose particles of Yaginuma-2 form a strong dense film-like cellulose wall structure formed of primary cellulose particles compacted so uniformly and continuously that the borders of the particles are indistinct. Therefore, the Yaginuma-2 particles have a particle structure completely different from the claimed porous cellulose aggregate.

Furthermore, the pore values of the claimed pore volume range correspond to the pore volumes of a porous cellulose aggregate having both the intentionally increased pore volume of aggregated particles described in the present application and the pore volume derived from original cellulose. By intentionally changing the structure of the aggregated structure to increase pore volume, the claimed porous cellulose aggregate has increased plastic deformation properties. *See Specification at paragraph [0092].*

The present application describes a method by which the claimed porous cellulose aggregate may be obtained that is neither disclosed nor suggested by Obae or the Yaginuma

references. Among other things, this method comprises drying a dispersion containing two or more cellulose dispersion particle groups having different average particle sizes, wherein a medium of the dispersion is a liquid and the average particle sizes of the cellulose dispersion particles are 1 to 110 μm. *See Specification at paragraph [0110].* However, the claimed porous cellulose aggregate may be produced by other means, and is not limited to this method.

By mixing two or more cellulose dispersion particle groups having different average particle sizes, a large pore volume within a particle may be provided. When the cellulose dispersion is dried, the cellulose dispersion particles having a smaller average particle diameter enter among the cellulose dispersion particle ingredient having a larger average particle size to form a secondary aggregate structure. *See Specification at paragraph [0115].* Those cellulose dispersion particles having a smaller average particle diameter forming the secondary aggregate structure are referred to as primary particles. *Id.*

The Examples of the present application described below illustrate the mechanism described above.

Table I:

Example #	Average Particle Size (large)	Average Particle Size (small)	Weight Ratio (A:B)
Example 1	55 μm	5 μm	50:50
Example 2	55 μm	3 μm	40:60
Example 3	55 μm	8 μm	60:40
Example 4	82 μm	5 μm	50:50
Example 5	82 μm	3 μm	90:10
Example 6	36 μm	5 μm	50:50
Example 7	30 μm	1 μm	10:90
Example 8	102 μm	22 μm	50:50

A: Cellulose particle group having a larger average particle size
B: Cellulose particle group having a smaller average particle size

The pore volume of the porous cellulose aggregates of the present application may be controlled by selecting a suitable weight ratio of the cellulose particle group having a larger average particle size to the cellulose particle group having a smaller average particle size. *See Specification at paragraph [0116].*

Regarding the particle shape of the cellulose particle group having a larger average particle size, a ratio (L/D) of 2.0 or more is preferable, where in L is the average length of the major diameter of the particles and D is the average length of the minor diameter of the particles. The larger an L/D ratio, the more profoundly excessive particle aggregation is inhibited at the time of drying, and the larger the pore volume within a particle. *See Specification at paragraph [0017].* This effect is neither disclosed in nor suggested by Obae. Therefore, Obae cannot be

achieve the claimed pore volume merely by adjusting the hydrolysis conditions described by Obae and so on.

In Yaginuma-1, pore formation can be obtained by removing a third ingredient. In Yaginuma-2, pores can be obtained by using the organic solvent. In comparison, pores can be obtained simultaneously with drying in the method of the present application described above.

Yaginuma-2 is further different from the claimed porous cellulose aggregate with respect to particle structure and specific surface area. Tthe claimed porous cellulose aggregate has the specific surface area of 1.3-12.5 m^2/g, while the porous cellulose particles of Yaginuma-2 has the dense and continuous cellulose wall structure mentioned above. This wall structure of Yaginuma-2, which is believed to be caused by drying in the presence of an organic solvent, results in compositions having poor water permeability and an inability to disintegrate in water. On the other hand, the claimed porous cellulose aggregate has properties to disintegrate in water.

The discussion of the preceding two paragraphs also applies to Yaginuma-3.

To address the admitted deficiency in Obae, the Examiner cites the Yaginuma references for the claimed aggregate pore volume. The Examiner asserts that the cellulose powders of Obae are prepared in a very similar manner to the porous cellulose particles of Yaginuma. The Examiner asserts that only the HCl concentration, temperature and duration of stirring and the solid content prior to spraying differ. Because the Examiner believes that the processes are so similar, the Examiner argues it would have been obvious to modify Obae to achieve the claimed pore volume. However, referring to Exhibit A, "Comparison between the present application and cited references," applicants strongly disagree that the processes are very similar. It should again be emphasized that the present invention is not restricted to any of the process conditions shown in the table. The other methods are also possible.

Further, the Office Action asserts that "one of ordinary skill in the art would have been motivated to obtain a large pore volume, such as taught by Yaginuma, in order to increase compaction strength, as reasonably taught by Kennedy et al." However, Kennedy does not suggest the process of the present described above nor intentionally increasing the pore volume. Kennedy cannot serve as a motivation to combine the Yaginuma references with Obae because it is impossible to simultaneously achieve all of the claimed properties without intentionally increasing the pore volume.

Furthermore, the attached Table shows that one of ordinary skill in the art could not have combined Obae with Yaginuma 1-2 and Ek because the processes of Yaginuma 1-2 use an organic solvent, and the cellulose concentration in the process of Ek is higher than that of Obae.

Accordingly, claim 1 is nonobvious over Obae in combination with Yaginuma-1, Yaginuma-2, Yaginuma-3, Kennedy, and Ek. Claims 2-12 are also nonobvious over Obae, Yaginuma-1, Yaginuma-2, Yaginuma-3, Kennedy, and Ek because claims 2-12 depend from claim 1. Therefore, the rejection of claims 1-11 under 35 U.S.C. § 103 should be withdrawn, which is respectfully requested.

III. Conclusion

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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Comparison between the present application and cited references

○: meeting the claimed property ×: not meeting the claimed property

	The present application	Obae (WO02/02643)	Yaginuma-1 (JP01-272643)	Yaginuma-2 (JP02-084401)	Yaginuma-3 (JP03-264537)	Ek (US5,607,695)
Product	Crystal form	Crystal form I	Crystal form I	Crystal form I	Crystal form I	Crystal form I
	Average particle size: more than 30 μm and 250 μm or less	○ 20～250μm	○ a fraction of not less than 350 mesh by 90wt% or more (more than 132μm)	○ at most 100μm	○ at most 100μm	× Minimum size: 100μm or more Average particle size of Examples exceeds 250μm.
	Specific surface area (BET method using nitrogen): 1.3-12.5m^2/g	○ 0.5～4.0m^2/g	○? not described	× 20m^2/g or more (Ex2: 24.1m^2/g)	× 20m^2/g or more	?
	Pore volume in a range of pore diameter of 0.1-10μm (mercury porosimetry): 0.265-2.625cm^3/g	× not described (0.261ml/g)	○ a porosity of 20% or more、(Ex4:20%) *pore volume: 0.161cm^3/g or more	○ Pore volume by pores having a diameter not less than 0.01 cm of 0.3 cm^3/g or more (Ex1: 0.65cm^3/g)	○ 0.3cm^3/g or more	?
	Particle structure: a secondary aggregate structure formed by aggregation of primary cellulose particles	○	× (a film-like dense and strong cellulose wall structure formed of primary cellulose particles compacted so uniformly and continuously such that the borders of the particles are indistinct)	× (a film-like dense and strong cellulose wall structure formed of primary cellulose particles compacted so uniformly and continuously such that the borders of the particles are indistinct)	× (a film-like dense and strong cellulose wall structure formed of primary cellulose particles compacted so uniformly and continuously such that the borders of the particles are indistinct)	?
	Angle of repose: 25° ore more and less than 44°	× (Examples: 54～44°)	○? not described	○? not described		?
	Disintegration of cellulose particles in water (after treatment by supersonic wave was performed for one minute ,the samples were observed with a microscope)	○	×	×	×	×

Comparison between the present application and cited references

O: meeting the claimed property ×: not meeting the claimed property

	The present application	Obae (WO02/02643)	Yaginuma-1 (JP01-272643)	Yaginuma-2 (JP02-084401)	Yaginuma-3 (JP03-264537)	Ek (US5,607,695)
Process for preparing the target product	Process comprising a step of drying a dispersion with 5-40 % by weight containing two or more groups of primary cellulose particles having different average particle sizes and a liquid medium wherein the cellulose dispersion particles have an average particle size of 1 to 110 μm.	Process comprising i) hydrolyzing a natural cellulosic material to obtain a dispersion of cellulose having an average polymerization degree of 150 - 450, ii) obtaining a cellulose dispersion (25 % by weight or less) wherein the average L/D value of particles capable of remaining on a 75- to 38 μm screen before drying of the cellulose dispersion is 3.0 - 5.5, by conducting stirring during the hydrolysis reaction or in a subsequent step, and iii) drying the thus obtained cellulose dispersion.	Process comprising mixing cellulose particles with a third ingredient such as a crystalline material insoluble or poorly soluble in water and soluble in an organic solvent, granulating and drying using them or using an aqueous solution of water-soluble organic solvent, subsequently extracting and removing the third ingredient with an organic solvent	Process comprising granulating and drying particulate natural cellulose dispersed in an organic solvent by spray-drying method		Mechanically treating hydrolyzed cellulose that has been moistened with 0.5-0.9 times of dry cellulose weight of water (=Cellulose concentration of 52-66 % by weight) and then drying
Comments	A porous cellulose particles having property of disintegrating in water have been firstly accomplished by the present invention.	They do not have intentionally formed pores	Porous cellulose particles have the dense and continuous cellulose wall due to drying with the organic solvent and thereby have little water permeability and therefore they do not disintegrate in water.	Porous cellulose particles have the dense and continuous cellulose wall due to drying with the organic solvent and thereby have little water permeability and therefore they do not disintegrate in water.		When the porous cellulose particles are immersed in water or an organic solvent, they have mechanical resistance to maintain the matrix. Therefore, it is obvious that they do not disintegrate in water.